IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MISSOURI
WESTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff,	No. 08-01780 05-06002-CR-W-GAF
	August 28, 2007
LISA MONTGOMERY, Defendant.	

TRANSCRIPT OF THE TESTIMONY OF
MR. ALAN EVANS

BEFORE THE HONORABLE GARY A. FENNER

UNITED STATES DISTRICT JUDGE.

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I N D E X

THE COURT: Thank you. You can be seated. Ready, Mr. Whitworth

MR. WHITWORTH: Yes.

THE COURT: And, Mr. Duchardt, are you ready?

MR. DUCHARDT: Yes.

MR. WHITWORTH: Here are our exhibits we are going to offer. Your Honor, the United States calls Doctor Alan Evans.

ALAN EVANS

having been sworn, testified:

DIRECT-EXAMINATION

BY MR. WHITWORTH:

Q Sir, Would you state your name for the court?

A. Alan Evans.

Q Where are you currently employed?

A Montreal Neurological Institute, Research Institute affiliated with McGill University.

Q. How long have you been employed there?

A Almost 24 years.

Q What is your current title.

A Professor of Neurology.

Q And what kind of work do you do at McConnell Center?

A I use different forms of brain imaging research instruments M. R. I. scans and PET scans studying the

structure and function of the human brain.

Q Have you essentially devoted your career to the study of the human brain?

A Yes.

Q You also teach at the Montreal Neurological Institute?

A Yes I do.

Q Are you a professor there?

A Yes.

Q How long have you been a professor?

A I have been a full professor for eleven years.

Q Could you describe your formal education for the court, please?

A I did undergraduate in physics and mathematics. Master's in medical physics. Ph.D. in biophysics.

Q Do you have any specialty degrees in the field of brain imaging?

A They're no special degrees in brain imaging.

Q And where did you study your undergraduate?

A. Liverpool University.

Q From there where did you go?

A To Surrey University.

Q What did you do?

A Medical physics.

Q From there were did you go?

A Leeds University.
Q. What did you study?
A Biophysics.
Q Did you get your Ph.D. there?
A Yes, I did.
Q Was your first job with the Atomic Energy of Canada Institute?
A Yes, it was.
Q How long did you stay there?
A. Five years.
Q Then in 1984 you moved to the Montreal Neurological Institute?
A Yes.
Q Have you published any peer-reviewed articles?
A Two hundred and 79.
Q And are you also a co-author of a research book on the human brain?
A Yes.
Q And are you also a journal reviewer?
A Yes.
Q Could you explain what that is to the court?
A. This requires me to look over candidate articles for publication in peer-reviewed literature, scientific literature. And I review the papers and make scientific comment on the legitimacy of the data, methodology and the

result.

Q. Do you work on the National Institute of Health.

A. Yes, I have a contract right now with the N. I. H. to study the developing child brain. This is a study that involves six sites in the U.S. collecting data from five hundred children. I am regularly at the N. I. H. in Washington to discuss this project or related projects as we integrate from these various research studies founded by the N. I. H.

Q. What was the value of the grant you received in connection with that?

A. It's approximately thirty five million.

Q Have you also received grants from National or the Canadian Institute of Health Research?

A Yes, numerous grants over the years. The largest one was a thirty two million dollar grant for PET and M. R. I. equipment.

Q. Have all these studies been related to the human brain?

A Yes.

Q Are you a member of any professional organizations?

A Yes, the Organization for Human Brain Mapping.

Q In fact, you were one of the founders of that organization, is that correct?

A Yes.

Q Have you received any special awards of note?

A senior Scientist, C. I. H. R., Senior Scientist, allocated in 2001.

Q Was that the first time that had been awarded?

A No, it happens periodically. And Computer World Smithsonian Laureate. This is for activities and establishing advanced complication techniques in the study of the brain science.

Q Now you have prepared a C. V. which I have marked as Government's Exhibit A, is that correct.

A. Yes.

Q Have you seen that?

A Yes.

MR. WHITWORTH: We offer Government's Exhibit A.

MR. DUCHARDT: No objection.

THE COURT: Received.

(PLAINTIFF'S EXHIBIT A WAS RECEIVED IN EVIDENCE.)

Q Government's Exhibit D. is that a summary of the highlights of that C. V.

A Yes.

MR. WHITWORTH: We offer that as well.

MR. DUCHARDT: No objection.

THE COURT: Received.

(PLAINTIFF'S EXHIBIT D WAS RECEIVED IN EVIDENCE.)

Q Now, Doctor, have you ever testified as an expert in court before on the human brain?

A No.

Q Have you ever been asked to testify as an expert before?

A No.

Q This is the first time when I contacted you, is that correct?

A Yes.

Q Now, did you, at my request, review a report of Defense Expert Doctor Ruben Gur dated April 3, 2007?

A Yes.

MR. WHITWORTH: Your Honor, I have marked as Government Exhibit C. a copy of Doctor Gur's report, we offer that.

MR. DUCHARDT: No objection.

THE COURT: Received.

(PLAINTIFF'S EXHIBIT C WAS RECEIVED IN EVIDENCE.)

Q And then did you prepare a report in response to Doctor Gur's report I have marked as Government's Exhibit B.

A Yes.

MR. WHITWORTH: We also offer that report as well.

MR. DUCHARDT: Also no objection.

THE COURT: Received.

(PLAINTIFF'S EXHIBIT B WAS RECEIVED IN EVIDENCE.)

Q Doctor Evans, did you review any of the scientific literature referenced by Doctor Gur in his report?

A Yes.

Q In preparation to writing your report?

A Yes.

Q And did you disagree with any of Doctor Gur's findings and conclusions?

A Yes.

Q Do you believe Doctor Gur's findings and conclusions regarding Lisa Montgomery are scientifically reliable?

A No.

Q And before we get into the specifics could you tell the court briefly what PET, what the PET scan is and what M. R. I. imaging does?

A. M. R. I. imaging for the purposes of this report provides quantitative analysis of brain anatomy, brain structure. PET provides quantitative results on brain physiology, brain function.

Q What are those two tools used to do in the scientific world and the medical world?

A To study normal brain, either development at one end of age or normal age looking at normal variation in the population and then to compare those normal results to

specific abnormal conditions, almost always in groups, to study the characteristic profile of that group. For instance, Alzheimer's disease or child development, those are two examples.

Q Can you use the M. R. I. or PET to identify brain tumors?

A Yes.

Q Can you use those tools to detect epilepsy.

A In association with other methods you normally wouldn't use M. R. I. by itself to detect and diagnose epilepsy but in combination with other methods, yes.

Q Are there studies being conducted through the use of those tools to detect Alzheimer's disease?

A Nobody has been able to use M. R. I. to detect and diagnose Alzheimer's disease in a single subject. There are many research projects going on to look at the normal anatomical profile of Alzheimer's in a population. So you may study tens or even hundreds of Alzheimer's patients and try and characterize the profile of Alzheimer's disease in the population.

Q Can the PET and M. R. I. be used to diagnose psychiatric disorders?

A Diagnose, no.

Q To detect?

A We conduct research in the psychiatric population

in groups absolutely, that's is being done in a number of research. But to make any sort of definitive statement about the psychiatric diagnosis for a single subject is not done.

Q Can you use PET or M. R. I. to detect an individual who may be prone to criminal behavior?

A Not to my knowledge.

Q Have you seen any studies to that effect?

A No.

Q Now, if could you please explain to the court any problems or disagreements you have with Doctor Gur's report?

A Okay, I will break up my comments into three components. First of all the methodology of behavioral imaging, the report seeks to identify abnormalities in this particular case by looking at claimed differences. However, Doctor Gur notes all of the behavior indices are positive. She's a smart person. So it's not a question of the behavior imaging results being low. The point that he is trying to make is there is a left-right difference. He presents no evidence what is the normal left-right difference. So it's impossible to make any interpretation of these results without that normative information.

Q For this to be reliable information would there have to be a comparison?

A There would have to be a comparison of the

left-right difference.

Q That is not done here?

A That is not done. Secondly, the section on structure M. R. I., the results that are presented and in a common scientific format using so-called Z scores, are different from normal. Basically the results are structural M. R. I. are less than one percent deviation away from normal.

Q Less than one standard deviation, what does that mean?

A Well, the best analogy I can give you of this is to, is imagine the average American male is five foot nine inches, the average American female is five foot, four inches tall. These results are tantamount to taking a woman who is five foot, seven inches, one standard deviation away, three inches and declaring that the five foot, seven woman is a man. One, it is very, very, difficult to argue that that five foot, seven woman is abnormal. Over 30 percent of the population is outside that range, female population.

Secondly, whereas we do have a profile for the man, in the analogy there is no profile for the structural profile of pseudocyesis or disorder or any other psychiatric disorder. The structural M. R. I. data are unsupportable in my view on two counts: It's not significantly far from

normal and there is nothing that it is close to, no psychiatric disorder it could be claimed this is close to. Both counts I find this evidence to be unsupportable.

Q If you look at the Z scores could you explain you made some notation in your report the percent of population exhibiting such difference from normal, could you explain that to the court?

A Okay, the results presented in Doctor Gur's report present results for brain structural region with a Z score of point five to point seven. Those numbers are consistent in that range, approximately fifty percent of the population would have Z scores of that range.

Q Would you consider that normal or abnormal?

A It is in my view within the normal range. It's less than one standard deviation away from the mean.

Q In your view would Lisa Montgomery's brain be within the normal range?

A. For those regions quoted here, yes. There is one slight difference to that, the ventricular measurements are Z score one. A Z score one, approximately 30 percent of the population have a Z score of one.

Q In that one area. What effect would medication have on any of these scores?

A Medication is unlikely to affect these structural M. R. I. scores, possibly could affect functional.

I have yet to comment on the PET finding.

Q. I am jumping ahead. Are you finished with this area?

A With the structural, yes.

Q Would you move on to the PET imaging?

A On the PET imaging the basic story here is the profile, patient profile, is significantly different from a formative population. There are a number of issues with the methodology of this study. Most salient, my concern is the values for the patient are typically above normal. The values for the normative population are around a level of one for normalized data. Basically you cannot have it both ways. Either the data for the patient are normalized in which case they should also count around one or the patient, normative values should also be elevated. You can't have it both ways. Normal size means the data have to be around the normal, around one. Her values don't.

Q What does that mean to you?

A It means I have concerns about the methodology of the analysis here.

Q Would you consider Doctor Gur's methodology to be scientifically reliable.

A. This particular methodology here of comparing normalized data to a stick subject is pretty standard methodology, not Doctor Gur's methodology particularly.

It's a general strategy but I have concerns that methodology is being applied incorrectly in this particular setting.

Q. Did you in fact ask the follow-up question of Doctor Gur to try to get clarification on that issue?

A Yes.

Q Did you get a response from him?

A I got a response but it wasn't a satisfactory response, didn't address the fundamental issue how these data are normalized, how can you compare a normative, which is around one which it is with her values which are not, it seems they are not normalized.

Q Would it be helpful to use a chart to explain what you are saying?

A Perhaps.

MR. WHITWORTH: With the court's permission.

THE COURT: Yes.

A You have series of gray matter, the thinking part of the brain, and other regions in white matter, the cables in the brain, typically the gray matter metabolism in white is low. So if I want to normalize, normalize the whole brain value, these are ten percent above, ten percent below for the sake of argument. That is what Doctor Gur has said he has done. So these values for gray matter are, will be above the line of normal, that's fine. But if the normalization is done it has to be done for both patient

population and the normative population. So what you are claiming is that the values for the subject --

Q Lisa Montgomery you are referring to?

A Are above normal. This is normal. This is Miss Montgomery. And the brain is a significant difference. What I don't understand is how if you normalize the brain you don't have all the normative values above zero and Miss Montgomery above zero, what he has is Miss Montgomery's values are, the normative are hunting around zero. So you have a situation like this. This is zero. Normative group is doing something like this. As I would expect if you were normalizing to zero, Miss Montgomery is sitting up here (indicating). If she has been normalized in the same way, her values should be also around zero, should be high in some areas, low in areas but the average should also be zero.

Q So do you have an opinion?

A If the average is not zero her data has not been normalized as the normative population so I have a concern about the methodology.

Q Do you have some explanation what you think, where you think Doctor Gur made a mistake?

A It would be speculation on my part to say what I think the reason for the value is.

You can't have it both ways. Her values are all

high. Then she hasn't been normalized properly.

Q Her values are all high in this particular high?

A All of them.

Q Resume the witness stand. Now, do you have any, in a summary and conclusion of Doctor Gur's report do you have any problem with anything he wrote there?

A Well, as a general statement, we are looking at the scientific methodology rather than anything specific to bring imaging. And what you have here are results which are marginally different from normal and the claim is being made they are consistent with a range of psychiatric disorders.

Q Such as?

A Pseudocyesis, disassociation of self, impulsivity. None of which we have normative data. None of which is presented here. The claim is her results are consistent with those conditions. Those conditions are not described in the peer-reviewed literature.

Q So there is no peer-reviewed literature which would support for instance the pseudocyesis claim by Doctor Gur, is that correct?

A We don't have any results in the field of it for pseudocyesis. Had imaging in pseudocyesis to claim these are consistent with that is not scientifically supportable.

Q Doctor Gur also concludes the patterns he noted in defendant's brain indicate increased vulnerability to

impulsive behavior, do you agree or disagree with that statement?

A I disagree.

Q Why?

A Unless the results are presented this is the profile of impulsivity and there is a significant difference between her and that moment of profile then this is just a speculative statement. No supporting literature.

Q Doctor Gur also writes increased hypothalmic and related activation is potentially a source of vulnerability to pseudocyesis, do you a agree or disagree with that conclusion?

A Again no profile for pseudocyesis so the claim is unsupportable.

Q So Doctor Gur also concludes the brain abnormalities documented in the neuropsychological and the structural and functional neuroimaging studies provide evidence Miss Montgomery's actions have been influenced by a compromised neural substrate. Her brain is neither structurally nor functionally sound and the damage is in areas that are needed for integrated behavior under full conscious control. Do you agree or disagree with that conclusion?

A I disagree because I think it's over interpretation. Doesn't have the data to support those

conclusions.

Q Would Doctor Gur's report in your opinion pass peer review in the scientific community?

A No.

Q Doctor Gur's findings and conclusions, are they generally accepted in the scientific community with respect to this report?

A With respect to this report it's not in the scientific community. Is the question would they be accepted in the scientific community?

Q Reviewed that report?

A That would mean it didn't, it would never achieve peer-reviewed approval.

Q One thing I don't believe I touched back on was the effect of medication. Did you receive some information that defendant was taking some medication at the time these tests were taken?

A Yes.

Q Prescribed medication?

A Yes.

Q Would that have any effect on the results?

A Yes, it's quite possible that a subject on medications or in a heightened state of anxiety being placed in a PET scanner would show elevated metabolism.

Q In Doctor Gur's report has he taken the effect of

medication into consideration anywhere in that report?

A No.

MR. WHITWORTH: That's all I have, Your Honor.

MR. DUCHARDT: May I have just a moment, Your Honor.

THE COURT: Yes.

CROSS EXAMINATION

BY MR. DUCHARDT:

Q Good morning again, sir.

A Good morning.

Q Let me first go through your pedigree a little bit and just make sure I am tracking correctly with everything. You had testified your undergraduate degrees are in mathematics and physics, correct?

A. Yes.

Q And your masters is in medical physics and your Ph.D. is in biophysics.

A Correct.

Q Your forte in terms of your work you have done in your lifetime is in the field of research, is that correct, sir?

A Correct.

Q It is not clinical work.

A It's brain research.

Q And you are not trained formally specifically in

psychology or neuro-psychology, is that correct?

A Yes.

Q And you really don't do clinical work in terms of treatment of patients, is that true?

A Right.

Q But you have worked extensively with the development and understanding of PET and M. R. I. testing?

A Correct.

Q Essentially PET testing, tomography, is basically our way through using radioactive materials of being able to see the functioning of the brain, is that a decent way of putting it?

A Correct.

Q And particularly in M. R. I. testing -- and it has gotten more and more sophisticated over time but basically it's looking at the structure of the brain?

A Correct.

Q Having the two together is actually a very positive thing to have because you can compare structure and function both, well, anomalies to be able to reach more conclusions with both than you could with just one, is that a fair statement?

A Yes.

Q You are familiar with Doctor Gur and his background, Doctor Ruben Gur from the University of

Pennsylvania, is that correct?

A Yes.

Q You all had thought about collaborating on a project at one time, is that a fair statement?

A Not that I am familiar with.

Q You don't recall?

A I'm not familiar with it.

Q Are you in your testimony questioning Doctor Gur's capabilities and qualifications to do this sort of work?

A No, I am confining my comments specifically to the evidence presented to me in this report.

Q Do you have an opinion about Doctor Gur's background and capabilities and qualifications to do this sort of work?

A He's a well respected and well known scientist in the field.

Q Very much doing many of the things in Pennsylvania you are doing in Montreal.

A Yes.

Q Is that a fair statement?

A Yes.

Q Now, and I think I understand exactly what your positions are, but what I am trying to just tease out is the things you are not saying. That was one of them. The other thing I assume you are not saying that PET and M. R. I.

testing of themselves are not scientifically reliable, they are scientifically reliable?

A I think the distinction, I have a lot of confidence in M. R. I. and PET testing when studying group data. There's a difference between a group of normal and a group of Alzheimer's population. I have more concerns PET or M. R. I as a diagnostic or say anything definitive about a single subject.

Q I understand but really I am just talking about the science behind PET and M. R. I. testing and the ability to essentially take pictures and have something that is reliable in order to look at to then go the next step.

I assume you agree with me on that level PET and M. R. I. testing are universalically considered scientifically reliable?

A Yes.

Q Particularly the PET and M. R. I. testing that was done on Lisa Montgomery I assume you are not saying there is any problem in the testing that was done, you are not questioning that, are you?

A Depending on what you mean by testing. I have no concerns about the initial data collection, the scanning itself. My concerns are with the analysis of the data that was obtained from those machines.

Q So, in other words, we can agree there is really

no question in terms of what data was gotten through the testing itself?

A From the scanning.

Q Yes.

A The analysis is the issue.

Q If I understood your testimony correctly you are also not questioning the mathematics that Doctor Gur employed in terms of the type of analysis he was doing through use of statistics, is that correct?

A I am absolutely questioning the statistical analysis.

Q What I am saying is the method of using statistical analysis to analyze data you are not saying generally that is unacceptable?

A No, we all do statistical analysis of quantitative brain data. My concerns, this is being done inappropriately and incorrectly.

Q So we agree that PET and M. R. I. testing generally is good science, true?

A Correct.

Q We agree that the PET and M. R. I. testing in terms of mining data from Lisa Montgomery in this case is okay, that is true?

A The scanning is okay.

Q And essentially the information, the data that was

produced you have no problems with?

A The data itself, no.

Q That's what I am saying. Any way I can put these questions better you tell me, but I am just trying to make sure we are agreed on this. Again the general notion of use of statistics to make sense out of the data is certainly well accepted in the scientific community, is that correct?

A In groups. There is lot of controversy about the use of statistics applied to a single subject.

Q And particularly that controversy is in the research field, is that correct, sir?

A In the research world where I am familiar, if we do not try and make an inference about a single subject the data is too variable across the population for us to make a definitive statement about one individual. We confine ourselves to discussions of groups.

Q But the logic is completely different when you are looking in the clinical setting, is that correct, sir?

A Statistics are statistics.

Q. Agreed. Wouldn't it be a fair statement in a research situation that you would not consider a variation significant unless it was on the order of two standard deviations from normal?

A No.

Q Basically just to get out of the lingo of

mathematics and statistics and into language everybody can better understand, you are looking at the need for there to be variation from an individual away from 95 percent essentially of a normal population, is that correct?

A Yes.

Q Now, isn't it true though in a clinical setting the numbers are way different and treatment is based oftentimes on less than a half of a standard deviation from normal, more like a twenty percent variation.

A I am not sure there is a difference. The point is is the signal that is derived from the measurements is significant or not. Either it is or it isn't. In this case the results are not significant, not sufficiently significant to warrant the kinds of interpretations and conclusions that have been drawn in this report.

Q Don't we normally treat people for heart disease who show less than a half of a standard deviation from normal in of many of their symptoms and isn't that standard practice, or are you familiar?

A I am not familiar with how the heart is managed. The issue for me and my competence in looking at this report is are these claims scientifically supportable and the answer is no.

Q But there is science and there is science. There is science applied and there is science in the research

field, is that a fair statement.

A No, just science.

Q Your belief is that in the clinical field that you would have to have, in order to justify treatment you would have to have more than two standard deviations from normal in order to justify treatment?

A No, I am not making a statement about treatment. I am making a statement whether the data are interpretable with the conclusions being made. This is not a statement about treatment.

Q Are you disagreeing with Doctor Gur's notion that for instance the hypothalamus in terms of its activation, its working as measured by the PET is at least a full standard deviation away from the normal?

A He has that result.

Q My question, do you disagree with that particular nugget of information?

A For the reasons I described before about the normalization issue, I have significant problem with establishing how far Miss Montgomery's results from the normative data. I explained the issue of normalization. So I am not happy with any of these PET results the way they are presented.

Q I wanted an opportunity to go into that so this is a good time to talk about it. You had Doctor Gur's report.

You asked for additional information about the methodology which Doctor Gur used in analyzing the data and he responded to that and that was all basically last week, is that correct?

A I had a response. The response was unsatisfactory. It didn't get to the nub of my concern.

Q But we haven't had the opportunity to hear that from you, at least on my side of the case, until now, is that true?

A Correct.

Q We haven't had an opportunity to present your further questions to Doctor Gur?

A Correct.

Q So we don't really know what his response will be to that until we can get that question to him. It's not that you have asked him the question and he has refused to answer?

A The answer was, didn't answer the question. It was too vague. They're two issues here. One, are the results significantly far from normal. Secondly, are those results consistent with any psychiatric disorder.

The second issue is an issue independent of this question. Even if there were two standard deviations what are they consistent with. Where is the evidence to demonstrate they are closer to a psychiatric profile

pseudocyesis, et cetera.

Q I will get to that part in a second. I wanted to stay with this issue about the data, the statistics and whether it is something that can be used. And if I am understanding your point correctly you are not confident yet in the variaation from normal of any of the PET testing as using Lisa's numbers versus the normal because of the reasons you have described, is that correct?

A Correct.

Q You are not saying they are wrong you are just saying you want additional information to decide one way or the other, fair statement?

A Yes.

Q It's not that you have done independent work with that to determine they are wrong, it's just you are wanting Doctor Gur to further explain what his findings are?

A My, the point I raise is a technical one, related to data analysis and normalization. That is independent of issues of a clinical nature with regard to meds, medications, and anxiety. It's independent of whether or not these results are consistent with any other disorder. That's three different issues I have just raised.

Q Sure but -- so we just need to figure out the numbers as far as you are concerned, whether they can be relied upon, is that a good way of putting it?

A Correct.

Q That's our first issue. Now, even on the other two points that you make concerning the question about medications and PET scan and variation from normal you are talking about, you are not saying that Doctor Gur's conclusions are wrong, are you?

A I am saying they're scientifically unsupportable.

Q There is a difference between those two statements, isn't there. In order to call him wrong you would have to be able to say this is not true for this reason?

A My position is basically with single subject data and normal variation we see in the normal population it is quite impossible to make a definitive statement about Miss Montgomery's brain data with respect to normal or abnormal.

Q And particularly now let me also make sure I understand, you did not study any of the information about Lisa Montgomery beyond the information provided in Doctor Gur's report, is that correct?

A I was also given reports from Doctor Ramachandran and Doctor Logan.

Q You are familiar with Doctor Ramachandran and Doctor Logan's diagnosis of pseudocyesis, is that correct?

A I read those reports.

Q. Just for the court reporter's help, pseudocyesis,

you want me to spell it, p-s-e-u-d-o-c-y-e-s-i-s. Did I do it right from memory?

A Yes, you did.

Q Is this a condition you personally have ever studied.

A No.

Q Do you feel you are in a position, based upon the review of the reports of Doctor Ramachandran and Doctor Logan who diagnosed Lisa as suffering from pseudocyesis, do you feel you are in a position to be able to confirm or deny those positions?

A I am not in a position to make any comment on clinical diagnosis. My comments are strictly to imaging methodology.

Q But you are familiar with the generalities of pseudocyesis from your education, that essentially that is a psychiatric condition whereby a person, obviously a woman, is in a position she believes she's pregnant to the point she actually has physical changes that are associated with that, is that correct, sir?

A That's what I read.

Q And you also understand that Doctor Ramachandran and Doctor Logan have also reached certain conclusions about other mental issues Lisa is suffering from, is that correct?

A That's what I read.

Q So Doctor Gur is not starting from a base line of no information about the particular subject he actually has some information from other sources, is that correct, sir?

A Yes.

Q And I know the answer to that and it's a silly question but for the record you have never met Lisa, is that correct?

A No.

Q You have never had an opportunity to talk with her or examine her or deal with her in any fashion that would assist you in reaching any of the conclusions you are going to be asked to reach, is that correct, sir?

A Correct.

Q. You have not read any of the materials other than contained in Doctor Logan and Doctor Ramachandran's report about this incident we are on trial for here?

A Correct.

Q Okay, sir. So to the extent that Doctor, you understand in reading Doctor Gur's report he has reviewed all of that information, is that correct, sir?

A Yes.

Q At least in that respect he has that much of a leg-up on you, would you acknowledge that?

A No, not at all. Quite the opposite. My comments are based on the facts presented to me in the report. It's

quite possible to make the assertion based on knowledge of the case, the results you see from imaging are consistent with that prior clinical profile. It would be much more plausible I believe if he had knowledge of the situation and able to make a statement these results are consistent with pseudocyesis not knowing the case. The fact he knows the case beforehand would suggest to me he's drawing the obvious interpretation that is required.

Q So, in other words, and again in the research setting I see that might make some sense but if you are in a clinical setting you certainly want all of that data in order to be able to treat properly, isn't that essential?

A Again, what one does with treatment isn't independent from characterizing are these brain data consistent with any specific disorder. You have to answer that question first and that hasn't risen to the level of scientific peer-reviewed approval.

Q Again are there uses of scientific data in the clinical setting that reach, do not reach the level of two standard deviations that are relied upon to support diagnoses otherwise obtained from other sources?

A Well, that would go into the issue of clinical judgment again. That is not a scientific position. The data do not support the statements being made in this report based on the evidence presented in this report, end of

story.

Q I understand that's your position. Is it entirely possible, if not probable, that treating physicians might disagree with you?

A I have been asked to comment on the scientific validity of the data and I have done that.

Q You have no comment though on whether there might be an honest disagreement with you, among scientists about whether it requires two standard deviations away from normal or more like a half a standard deviation away from normal when you are dealing with treatment in a clinical setting?

A I am sorry, the scientific method is the scientific method. It's scientific, true and significant and justifiable or not. This is not.

Q Now, particularly again your questioning of Doctor Gur has to do with his, well, let me ask it this way, In Doctor Gur's report did he specifically diagnose pseudocyesis?

A He said it was not inconsistent it was consistent, excuse me. Let me rephrase that. He said it was consistent with --

Q Do you want the report?

A Consistent with impulsivity, disassociation of self, high up-take, vulnerability, the potential for pseudocyesis, all of these things are true, they're all

possible but so is it being consistent with the brain of a lawyer.

Q So to a lawyer instead of doctor.

A There is no absolute connection here. It's speculative.

Q You mentioned increased metabolism in the hypothalamus and that also appears in your report. Let me show you Doctor Gur's report. And basically actually when he is talking about the increased and we are on page --

A Summary and Conclusions.

Q Yes.

MR. WHITWORTH: Which page.

MR. DUCHARDT: Four.

Q This is the copy of the revised report.

I didn't ask if it was all right to approach the witness. Is it okay.

THE COURT: Yes.

Q Basically isn't it true that Doctor Gur is talking about increased activation not in the thalamus but in the hypothalamus?

A. The hypothalamus is potentially a source of vulnerability to disorders.

Q Right. You had mentioned in your testimony and also in your report you had talked about increase in activation of the thalamus, it's not the thalamus, it's the

hypothalamus?

A. Hypothalamus is right underneath the thalamus.

Q I understand but they do different things, is that correct?

A Yes.

Q And you are familiar with animal studies indicating increased activation of the hypothalamus related to pseudocyesis?

A I am not familiar with animal studies.

Q What you are asking for is you are saying the only way to associate increased activation of the hypothalamus -- and I am saying it right.

A Yes.

Q The only way to associate increased activation of the hypothalamus with pseudocyesis if we have a woman in with pseudocyesis, create a data base and be able to show that, is that correct, sir?

A Yes.

Q In other words, by your standards we would never take products off the market because animal studies can't be used on to rely for potential dangers to human beings?

A The normal practice throughout pharmaceutical development is to do animal studies first and then to do studies, phase one studies in humans. You have to establish the same behavior takes place in humans as animals.

They're major difference in physiology between humans and animals. We have to start somewhere so we start from animals. But we can't go from animal study to clinical practice. There are years of assessment in clinical trials in humans before that case is reached.

Q Of course if we reach the thing is so bad in animals we are not even going to try on humans, is that a fair statement?

A No, you have to try on humans.

Q Even if the results on animals are totally negative we would still try on humans?

A That's, if the results in animals don't show any effect then why would you go to humans?

Q Exactly. If the results are very negative in animals then why would you go to humans, true?

A If the results are negative then you wouldn't go to humans. If the results are positive then you go to humans before you start disseminating in the general population.

Q Exactly, but we do utilize animal studies to justify all of this just because even though they're certainly differences between animals and humans they're very many similarities and mechanisms. And that's the reason why these animal studies are so important?

A. We have to start somewhere but we have to do every

phase before we can bring it to human clinical use.

Q Again I take it you are not familiar with the animal studies that show increased hypothalamus activity with pseudocyesis in the laboratory?

A No.

Q Assuming that I am describing the literature correctly would that make a difference to your position?

A The same story, the same position is it hasn't been demonstrated in humans. We haven't had any evidence presented here of human PET profiles of pseudocyesis so you can't make any claims about human PET profiles.

Q So you do not -- of course what you have acknowledged that Doctor Gur is not diagnosing pseudocyesis, he is saying that these findings are consistent with pseudocyesis, fair statement?

A He said they're consistent but the data is so vague in general to be consistent with a multiplicity of brain profiles so it is not particularly relevant or important to say it's consistent with pseudocyesis. It's consistent with many, many, many things.

Q. We are concentrating right now on the hypothalamus. We are not talking about other areas of the brain. Particularly you had mentioned that drugs that Ms. Montgomery took, psycho-active drugs she would have been taking for her condition at the time of the PET may have

impacted upon the PET result. I think that was essentially your testimony.

A That's not my testimony. That's the testimony of Doctor Gur -- Doctor Mayberg. I am not a clinician and I haven't made any statement to that effect in my report.

Q Doctor, particularly Doctor Helen Mayberg is another one of the government's experts in this case, is that correct?

A Right.

Q You had shared with her your report, is that correct, sir?

A Correct.

Q And you are not independently saying you are aware of any studies that would indicate that there would be any impact on medicines that Lisa Montgomery was taking in terms of any of the PET results explaining those, right?

A No, I am familiar with studies myself of where meds or psychological scanners affect PET results. You have asked me, in my report I made no mention of that issue.

Q Particularly were those results directed to the hypothalamus.

A Not particularly.

Q And were the drugs that were involved in those studies, were they the same drugs that were involved, that Lisa Montgomery is currently taking, Depakote, are you aware

of the medications that Lisa Montgomery was taking at the time of this examination?

A No, I am not.

Q Do you have available to you the study, can you get those you are relying on in making this point that her changes in the PET could be attributed to medications or just being in the scanner?

A I can get access to those.

Q And particularly did Doctor Mayberg provide to you any particular articles to that effect?

A No, she did not.

Q So what your testimony is is that even though there are, well, we start first with you are not sure that there are differences in the PET results, elevation in Lisa Montgomery's PET levels that are scientifically reliable because you want the answers to these questions first (pointing to chart), am I saying that right?

A That's one of the issues.

Q I am going through the three. The second question is whether there could be an explanation for those results other than the ones that Doctor Gur attributes and particularly whether the explanation if they're increased levels of activity that are shown, whether those are attributable to medicines or being in a PET scanner, that's a second question?

A Correct.

Q Any other issue you think should have been tested for and wasn't?

A As I said the third one is the statement these results are consistent with a specific disorder, where are the measurements and the references to those conditions which is being associated with. The report doesn't provide any of that.

Q What I was just trying to make sure of on this second issue about whether there is something else involved in the changes, is there anything else that you would speculate should have been checked but wasn't other than being in the scanner and being on certain medications, any other issue besides those two. Those are the only two I saw in your report.

A No, that's it.

Q The third issue, and you have already described it, is the whole question of can you really make any reliable scientific sense out of this data unless you had a normal population base to judge in terms, basically a pseudo scientific base to compare against that?

A Correct.

Q Isn't it a fair statement that certain areas of the brain for a long time have been associated with certain types of behavior?

A Yes, I think you could make those statements.

Q And particularly isn't Doctor Gur just indicating that those areas that are involved and are highlighted by Lisa's PET results are those areas that are normally associated with this type of issue, this type of psychiatric issue?

A. No, I think I have made my position clear, they are consistent with many sorts of disorders and states.

Q All of them?

A So I am comfortable with the statement these results are, quote, not inconsistent with those disorders but there is no causal connection. That is what I have a problem with, there is no relationship here that has been demonstrated. It's possibly, it's maybe -- it's totally speculation as far as I can see.

Q That gets back to my original question which is you are not saying Doctor Gur is wrong, you are just saying you don't think his numbers justify diagnosing pseudocyesis or these other post traumatic stress disorders or any of these other things through the use of the PET alone?

A The data, the case is not being made scientifically at all. It would never pass peer review.

Q Again in a research setting but you are not able to say in a clinical --

A No difference between, science is science.

Significance is significance. Either these results are consistent with pseudocyesis or they are not. They are not. There is no evidence to prove it is.

Q Now, and you are saying this different ways and I just want to make sure I am tracking with you. You are saying the data is inconsistent with pseudocyesis?

A. No, the statements that can be made they are not inconsistent. That is a million miles scientifically from the statement they are consistent with. That's a very, very weak statement. It could be consistent with anything. That doesn't mean it's consistent.

Q So you are saying that increased activation of the hypothalamus could be consistent with anything?

A Many, many, states of the brain, both normal and pathological. To characterize the PET profile of pseudocyesis is a lot more than saying there is a little bit of elevation in the hypothalamus.

Q And you consider that one standard deviation above normal, assuming your argument here can be addressed you think, you believe that is just a little variation.

A In my report I said one standard deviation would never be acceptable scientifically.

Q Scientifically. Let me ask you you had indicated in terms of the M. R. I. results and do you have any problems with Doctor Gur's analysis with the M. R. I.

results, statistically?

A The results as presented, the data, what he shows is standard deviations point five to point seven in areas he draws inference. That is no way near meeting the level of scientific proof.

Q And essentially the significance that Doctor Gur found, would you agree with me, is that while Lisa's total brain volume is not above normal her ventricular volume, at least the standard deviation, is above normal, is that correct?

A It's presented here as one standard deviation.

Q You in your report indicate, if you look at those two results in isolation, they don't mean anything?

A The two results being?

Q The two results of normal brain volume and the increased ventricular volume?

A And the question is.

Q The question is you don't believe there is any significance looking at those individual results?

A No, I don't.

Q Just so we all understand each other, ventricular volume is essentially the space inside the brain?

A Fluid space in the brain.

Q Essentially that's not organ, that's not fluid space, it's an indication of space in the brain as opposed

to working brain volume?

A Correct.

Q And now did you look and what you said was that one of the issues that you take exception with Doctor Gur is his finding that actually there is more significance to the increased brain ventricular volume than would meet the eye. Essentially saying that is actually a more significant result than would be indicated by the one standard deviation?

A No, I think we are at cross purposes here. Basically what he has presented in the figure, figure two, is a number of brain structural regions have significant values of point five to point seven. The ventricles are at one. So mathematically the ventricles are a little more abnormal than the brain regions. However, his interpretation is based on brain regions. Reduced volume of the right parietal and medial regions is consistent with the results of the neuropsychological testing. Right parietal dysfunction manifests itself behaviorally in loss of sense of self, difficulties in emotion processing, attentional neglect, and depressed or flat affect.

The point here is that all of those statements are made with respect to the point five to point seven level of significance. Nothing to do with the ventricles. Don't discuss the ventricles further.

Q But if you associate normal brain volume with the increased level of ventricule volume does that not indicate a reduction of the remainder of the brain?

A I see your question. Again you are coming back to the issue of are these brain sizes, brain volumes outside the normal range of those structures in the normal population and he has quoted them as point five to point seven. That's all you need to know.

Q In particular again you are looking at differences in each of these categories as opposed to looking at the possibility of whether you combine certain categories, for example, someone like Lisa having a normal brain volume but increased in ventricular volume and the significance of that versus someone who may very well have a greater brain volume and increase, greater than normal brain volume and increase in ventricular volume which may very well not indicate a reduction of size of the particular areas of the brain -- am I tracking, are you tracking my question?

A Well, I see where you are trying to go and I can only come back to his own data. He quotes her level of abnormality in these brain structures about point five to point seven. That is a very low significance. I am telling you that is a very low significance. This is well within the normal range.

Q But again, and I belabor the point one last time,

you do not believe there would be a difference in terms of looking at standard deviations when you are looking at a treatment situation versus a research situation?

A I am not going to comment on treatment.

Q Very well. Doctor Evans, Doctor Gur actually many years ago in a science article did some of the early research on this, on this area and actually built the data base upon which he relies and published about that, is that correct?

A Yes.

Q Have you actually read that science article?

A Yes, I have.

Q You are familiar with it?

A Yes.

Q Neurological deviation.

THE COURT: I am ready to take a lunch break if you want to review your notes and see if you have any further questions when you come back.

MR. DUCHARDT: That will be great.

THE COURT: We will be in recess until five minutes after one by the clock.

MR. DUCHARDT: Very good. Thanks.

RECESS

THE COURT: Thank you. You can be seated. Doctor Evans, would you come back up to the witness stand

and as you come back up I will remind you you are still under oath. And, Mr. Duchardt, do you have some more questions of Doctor Evans?

MR. DUCHARDT: Just a couple.

Q Good afternoon, sir, because we are going to have Doctor Gur here next week I want to make sure I get clear the problems so that I can relay it to him so that he can address the question that you had. And back-tracking to the question that had been posed of Doctor Gur if basically I had asked the question, if I understand it, regarding the normalization method and you indicated in the figure in his report the blue curve for Lisa is all above the unity limit. if CMRG is normalized by dividing by the whole brain mean for the brain matter R. O. I, that's regions of interest, right?

A Yes.

Q Then shouldn't the line be distributed about the unity line. That's basically what your question, the issue raised in your testimony, am I tracking right?

A I will have another try to clarify it. Basically you have to choose whether you normalize against a whole brain average or the average of just the brain region. You can do either one, but you have to do it the same way for both the normative population and Miss Montgomery, has to be done the same way in both cases. Either they are both

supposed to be hunting around one or both to be elevated. You can't have them separated.

Q You are not sure if he did that or not?

A That is right. I asked for a clarification and I didn't get it.

Q The answer that Doctor Gur made to your question was regarding the method for calculating the r/wb. These were the regional values in the R. O. I.s, the regions of interest, as shown in my last response divided by the whole brain-metabolic rates all in milliliters per hundred grams per min. Since these are punch biopsy by regions, mostly in GM, it is not unusual to see many or all above unity?

A. I would expect that would have to apply to both Lisa's results and normative data, sir.

Q And if that is the case, if he has done that already, then that answers your question?

A I need to know that he has done the normalization the same way for both sets of data and what exactly is that methodology. I didn't get an answer to what exactly did he do.

Q And that's the additional above and beyond what Dr. Gur has already said?

A I asked that question. But his answer didn't answer that question.

Q So that's the specific question that you need

answered?

A How come these curves behave differently. As I said on the board there, if the normal values are oscillating around about one that means you are normalizing just in the gray matter regions and your matter should be oscillating one, if they're high values there should be low in others so it all averages to about one.

Q In other words, you are expecting a certain result and you are not getting it?

A. It's basic methodology. It's not imaging per se. Just basic statistics and analysis.

Q What you are looking for is an explanation to that particular question?

A If you would like, I would like to have a proper mathematical explanation rather than textural description. I need to know exactly what has happened there.

Q You don't feel you have that yet?

A No, I don't.

Q Now, one last couple of questions and that concerns the areas of the brain that are showing the differences normal both in the M. R. I. and the PET. Now Doctor Gur associates those areas of the brain with particular types of cognition, is that a fair statement?

A Yes.

Q And isn't it a fair statement that the association

of those areas of the brain with that type of cognition is really textbook neurology and what we expect those brain areas to do?

A I think the way to summarize it, the temporal structures in the brain he refers to are generally known to be associated with what we call the emotional brain, emotional intelligence, emotional processing. So all of that is true as a general statement.

Q So to the extent you have those areas compromised you wouldn't disagree that way may very well have significance to those particular functions?

A It's possible. These measurements are measuring something called global metabolism, energy, it's not talking about specific reception, receptive transmissions, particular chemicals associated with chemicals. That would be potentially much more informative. This is generally nuts and bolts. It can go up and down. It really doesn't allow you to infer dysfunction if it's up or down.

Q What you essentially have is you could say up take in those particular areas of the brain whether it is increased or decreased as compared to normal, right?

A We have had this discussion about whether or not it is different but if you assume for a second it is in fact different you then are not entitled to explain what is going on there unless you have much more definitive information

than is presented here. Way too general.

Q All I am trying to do is make sure -- we are obviously on different pages for Doctor Gur's interpretation of the data. What I am trying to make sure of where we are on the same page in terms of what things do and what science, what things we can agree on and that's what I tried to do.

A You can agree those regions are involved in emotional processing, et cetera in general. We know that in studies other than from aging.

Q. And the last question that I am really just wanting to make sure, see if we can get agreement on, has to do with the general notion of PET testing, particularly what the PET testing can do is show either increased or decreased or normal utilization of glucose in those particularized areas of the brain as opposed to a normal --

A You can make measurement in an individual and you can compare that individual to the normal range which is what has been done here.

Q And basically that in terms of the data base that Doctor Gur is using you are not arguing with the validity with the data base?

A Not arguing with the validity of the data base. I am concerned the way the data base is being used to interpret Miss Montgomery's PET data.

Q What you are really looking for some answers from Doctor Gur. Now we have clarified the question I will get those to him and we will see if we can get those answers for you. Thank you, sir. That's all I have, Judge.

MR. WHITWORTH: We have no further questions, Your Honor.

THE COURT: Thank you, Doctor Allen.

CERTIFICATE

I certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

Elizabeth Shinn

Elizabeth Shinn
U.S. Court Reporter